

CLAIMS

1. A medical device, comprising:
- a needle having a rearward end and a forward end forming a sharpened tip, operable between a projecting position in which the sharpened tip is operable to pierce the skin of a patient, and a retracted position in which the sharpened tip is shielded against inadvertent contact;
 - a housing having a fluid cavity and a forward end;
 - a dead-space area in fluid communication with the fluid cavity and the needle, formed between the rearward end of the needle and the forward end of the housing;
 - a plunger having a forward end axially displaceable within the housing operable to expel fluid from the housing;
 - a piston tip projecting forwardly from the forward end of the plunger and configured to cooperate with the dead-space area; and
 - a biasing element for displacing the needle from the projecting position to the retracted position;
- wherein upon forward displacement of the plunger, the piston tip is displaced into the dead-space area to expel fluid from the dead-space area, and the plunger operates to release the needle for retraction by the biasing element.
2. The device of claim 1 wherein the dead-space area is part of the housing fluid cavity.
3. The device of claim 1 comprising a needle retainer for releasably retaining the needle in the projecting position.

4. The device of claim 3 wherein the needle retainer comprises a frangible connection and forward displacement of the plunger operates to fracture the frangible connection to effectuate release of the needle.
5. The device of claim 1 wherein the plunger comprises a cavity for receiving the needle after retraction.
6. The device of claim 1 comprising a hub connected with the needle during retraction, wherein the biasing element biases the needle hub rearwardly.
7. The device of claim 6 comprising a connector releasably retaining the hub against the bias of the needle.
8. A medical device, comprising:
 - a hollow housing;
 - a needle operable between a projecting position in which the sharpened tip of the needle projects forwardly from the housing and a retracted position in which the sharpened tip is shielded against inadvertent contact;
 - a catheter overlying the needle such that the sharpened tip projects forwardly from the catheter;
 - a needle retainer releasably retaining the needle in the projecting position;
 - a spring biasing the needle toward the retracted position; and
 - an axially displaceable plunger disposed within the housing, such that axial displacement of the plunger operates to release the needle so that the spring displaces the needle into the retracted position.
9. The device of claim 8 wherein the needle retainer comprises a radially deformable arm.

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